DUY TÂN UNIVERSITY

International School

Capstone Project 1

CMU-SE 450

Project Proposal

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ResumeGeniusAI - AI-Powered Resume Builder & Analysis integrated with the Job Search Platform

Submitted by C1SE.02

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Project Information

Project acronym	RGA		
Project Title	AI-Powered Resume Builder & Analysis integrated with the Job Search Platform		
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DOCUMENT INFORMATION

Document Title	Project Proposal		
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URL			
Access	Project and CMU Program		

REVISION HISTORY

Version	Date	Comments	Author	Approval
1.0	06/09/2024	Initial Release	Vo Van Minh	
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1. Project Title

AI-Powered Resume Builder & Analysis integrates with the Job Search Platform.

2. Project Overview

This project aims to develop an AI-powered platform that assists users in creating optimized, ATS-compliant resumes and provides a streamlined job search and application process. By integrating AI-driven resume suggestions, keyword optimization, and a powerful job search engine, the platform offers a comprehensive solution for job seekers. Users can build professional resumes, tailor them for specific roles, search for relevant job openings, and apply directly through the platform, all while receiving real-time feedback on their application's strengths and areas for improvement.

3. Project Background and Motivation

In today's increasingly competitive job market, crafting a resume that stands out and passes Applicant Tracking Systems (ATS) has become a critical challenge for job seekers. Furthermore, navigating multiple platforms for job searches, resume submissions, and application tracking can be time-consuming and confusing. This project addresses these challenges by providing a unified platform that integrates resume building, optimization, and job search functionalities. By simplifying the process from resume creation to job application, this solution helps users not only build strong resumes but also connect with relevant job opportunities quickly and efficiently.

4. Proposed Solution

The proposed solution is an AI-powered resume builder and analysis platform that also includes job search features, transforming it into a comprehensive job application tool. Along with assisting job seekers in creating optimized resumes, the platform will allow users to search and apply for job openings directly. It will include the following core features:

- **Resume Builder**: A guided interface to help users build professional resumes using pre-designed templates and guided sections for personal and work information.
- **Keyword Optimization**: An AI-driven tool that analyzes job descriptions and suggests the best keywords to incorporate, optimizing resumes for specific roles.

- **Strength & Weakness Analysis**: The AI will assess the resume's effectiveness based on job-specific criteria, highlighting areas for improvement and strengths.
- **ATS Compatibility Check**: The system will ensure the resume complies with Applicant Tracking Systems (ATS) standards, enhancing its chances of getting shortlisted.
- **Job Search Engine**: Integrated with job listings from various sources, this feature will allow users to search for relevant job openings based on their preferences (location, industry, salary, etc.).
- **Application Tracker**: A feature for users to track job applications, see the status of submitted resumes, and manage follow-ups with potential employers.

Technologies:

- **Node.js** and **React.js** will be used to build the platform.
- **Gemini API** for creating CV content, checking spelling, and correcting writing errors.
- **Natural Language Processing (NLP)** for analyzing job descriptions and resume content.
- **Machine Learning (ML)** for personalized resume optimization

This extended solution aims to streamline the entire job application process, from resume building to job searching and application management, providing a seamless experience for users.

- *Create the System context diagram.*

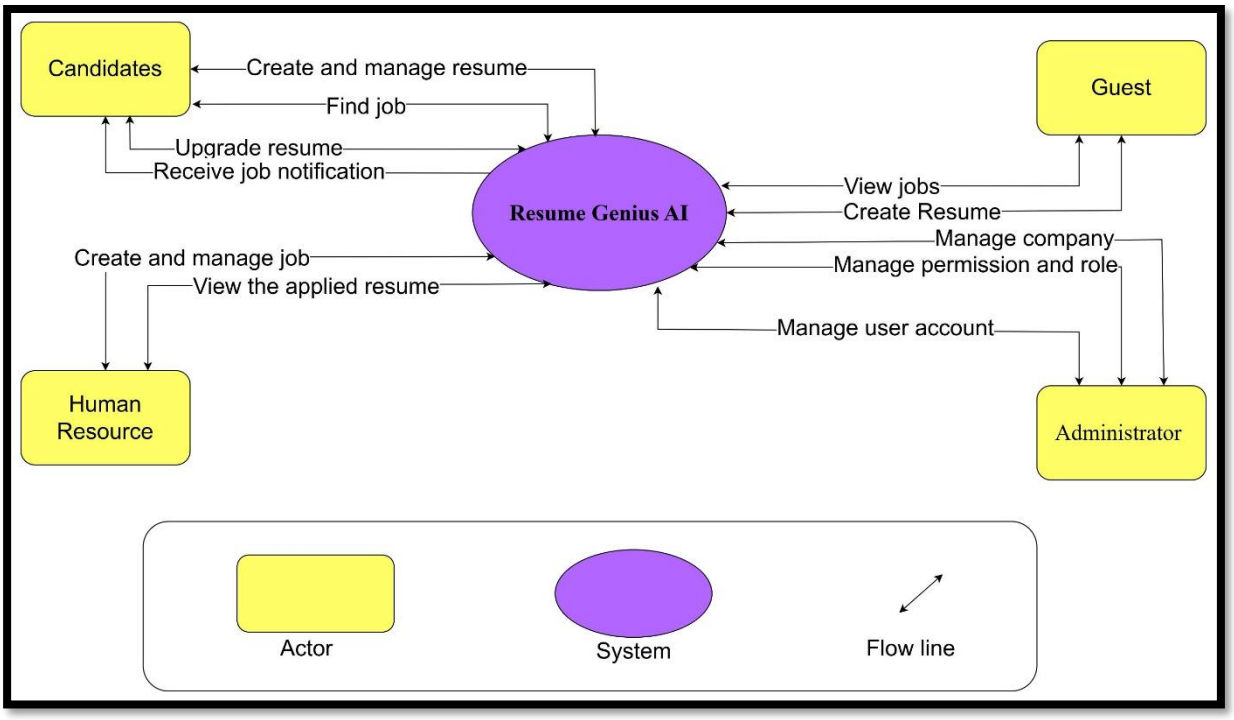

Figure 4.1 *System Context*

- The candidate has the responsibility to log into the system, the Candidate must first register. They can create a resume using pre-existing templates or upload their resumes for analysis and enhancement. They can also search for job openings and apply directly through the platform. Communication with HR representatives is facilitated through the platform's chat feature.
- Human resources has the responsibility to: To log in, the Human resources would need to register. HR professionals can post job descriptions, search for suitable candidates, and communicate with job seekers via chat. They can manage job postings and interact with applicants to find the best fit for their vacancies.
- Admin has the responsibility to: Manage user accounts, oversee resume submissions, and job descriptions, and ensure the smooth operation of all system functionalities. They manage user permissions, content management, and system maintenance.

5. **Related Works or Projects on the Market**

Several AI-powered resume builders and job search platforms exist in the market today, such as Resume.io, TopCV.vn, and VietCV.io. These platforms offer

features like resume templates, keyword optimization, and job tracking. However, they each come with limitations that our solution aims to address.

Table 5.1 *Table about Differences between the ResumeGeniusAi platform and other platforms*

Characteristics	**Resume.io**	**TopCV.vn**	**VietCV.io**
Create CV online	√	√	√
Various CV templates	√	√	√
Customize CV - Export CV (PDF, Word)	√	√	√
Find jobs	N/A	√	√
Connect with employers	√	√	√
User-friendly interface	√	√	√
Intuitive language support Customer service	N/A	N/A	N/A

6. Objectives and Deliverables

Objective 1: Develop an AI-powered resume builder that guides users through creating professional, ATS-friendly resumes.

- **Deliverable**: A fully functional web-based resume builder with customizable templates and real-time guidance.

Objective 2: Implement keyword optimization and ATS compliance checks to ensure resumes meet hiring standards.

- **Deliverable**: An integrated AI tool that analyzes resumes, suggests improvements, and checks for ATS compatibility.

Objective 3: Integrate a job search engine that allows users to find and apply for job openings directly on the platform.

- **Deliverable**: A job search feature with filters for location, industry, and job type, allowing users to apply for jobs within the platform.

Objective 4: Provide real-time feedback on resume strengths and weaknesses, along with personalized job recommendations.

- **Deliverable**: An AI-powered analysis tool that evaluates resume content and provides job suggestions based on the user's skills and experience.

Objective 5: Implement a job application tracker to help users manage and monitor their job applications.

- **Deliverable**: A dashboard feature that tracks the status of job applications and sends notifications for follow-ups or new job opportunities.

By achieving these objectives, the project will deliver a comprehensive platform that enhances the entire job application process for users.

7. Methodology and Tools

We are using the Scrum process for this project because Scrum is an iterative and incremental agile software development framework for managing product development. It defines "a flexible, holistic product development strategy where a development team works as a unit to reach a common goal" challenges the assumption of the "traditional, sequential approach" to product development, and enables teams to self-organize by encouraging physical co-location or close online collaboration of all team members, as well as daily face-to-face communication among all members.

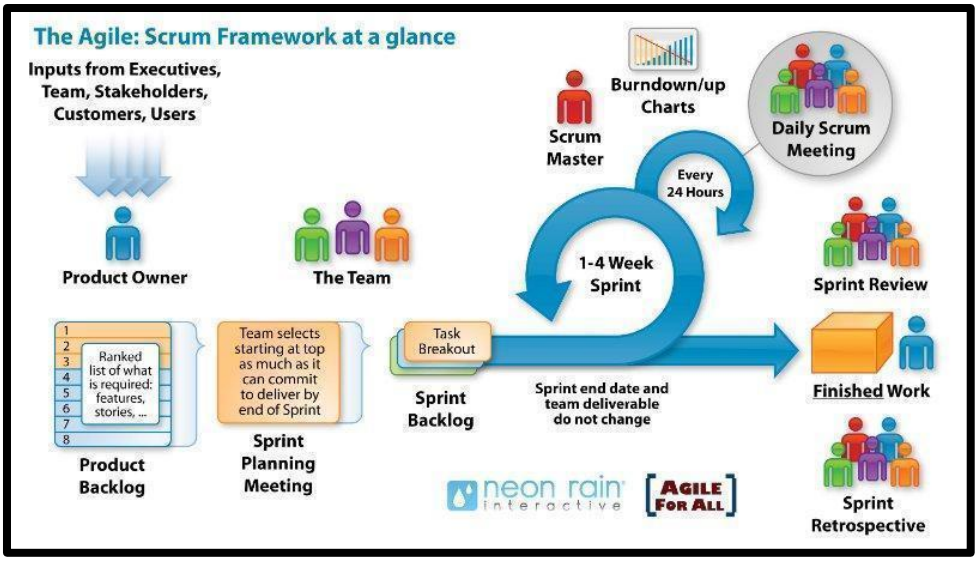

Figure 7.1 *General SCRUM Process*

- Scrum is an iterative and incremental agile software development framework for managing software projects and product or application development.
- Scrum focuses on project management institutions where it is difficult to plan.
- Mechanisms of empirical process control, where feedback loops that constitute the core management technique are used as opposed to traditional command-and-control management.
- Its approach to planning and managing projects is by bringing decision-making authority to the level of operation properties and certainties.

Tools and Technologies:

- Programming Language: HTML, CSS, JavaScript, Python.
- Framework: ReactJS, Flask, NodeJS
- System: Windows.
- Developing tools: Visual Studio Code, .
- Database Management System: MySQL, MongoDB
- AI/ML Integration: Gemini API, Natural Language Processing (NLP), Machine Learning
- Management Tool: Trello, Slack, Discord.
- Design Tool: Figma, Draw.io.
- Manage Source Code Tools: Git, GitHub.

8. Timeline

Table 8.1 *Timeline*

Week	Phase	Task Description
Week 1-2	Project Research & Requirements Gathering	Conduct research on existing platforms, identify user needs, and gather detailed requirements for resume-building and job search features.
Week 3-4	Backend Development (Resume Builder Engine)	Develop the AI-powered resume builder engine, focusing on the keyword optimizer and ATS compatibility features. Set up Node.js and MongoDB for backend services.
Week 5-6	Frontend Development (User Interface)	Build the user interface using React.js. Implement resume builder templates and job search filters. Ensure responsive design and seamless user experience.
Week 7-8	Job Search Platform	Develop the job search functionality. Build filters and job recommendations based on user profiles and resumes.
Week 9-10	Testing and Debugging	Perform unit testing on both frontend and backend components. Run user acceptance testing to ensure smooth resume building, job search, and application functionalities. Debug and fix issues.
Week 11-12	Final Deployment & User Training	Deploy the platform to the cloud (AWS). Provide user guides and training materials to help users navigate the system.
Week 13	Presentation & Feedback	Finalize project presentation, demonstrate the platform’s features to stakeholders, and gather feedback for future improvements.

9. Project Team

Table 9.1 *Table about project team*

Name	Role	Responsibilities
Van Minh	**Scrum Master**	**Facilitates the Agile process, ensures smooth sprint execution, removes blockers, and organizes daily stand-ups and sprint reviews.**
Duong Truong	Product Owner	Defines the product vision, manages the product backlog, prioritizes features, and ensures the team delivers value to the users.
Dinh Tai	Developer	Focuses on frontend development using React.js, designing the user interface, and implementing features like resume building and job search.
Ngoc Dat	Developer	Manages backend development using Node.js, Express.js, and MongoDB. Responsible for integrating AI/ML models, and APIs, and ensuring backend functionality.

10. Risk Management

Table 10.1 *Table about risk management*

Risk	Description	Mitigation Strategy
Technical Risk: AI Resume Analysis Accuracy	The AI models for resume analysis and keyword optimization may not provide accurate or helpful recommendations.	Begin training models early with diverse datasets. Continuously refine and improve the models based on user feedback and test cases.
Technical Risk:	The integration of third-	Review API documentation and test

Integration with Gemini API	party Gemini API may encounter compatibility issues or unexpected downtime.	integration in a staging environment. Implement error handling, monitor performance, and stay updated with API changes.
Time-Related Risk: Sprint Delays	Development tasks may take longer than estimated, affecting the sprint timeline and overall project delivery.	Maintain detailed sprint planning and add buffer time. Regular progress checks during stand-ups should be conducted to address any early delays.
Team Coordination Risk	Miscommunication or unclear task assignments could slow development and reduce team efficiency.	Use collaboration tools like Trello to track tasks and progress. Hold regular sprint retrospectives to ensure the team is aligned and address any roadblocks quickly.
Technical Risk: Security Vulnerabilities	The platform might face security risks, such as data breaches or unauthorized access to sensitive user information.	Implement security best practices like encryption, secure authentication methods, and regular security audits. Integrate tools for detecting vulnerabilities early.
Technical Risk: Platform Scalability	The platform may struggle to manage a large number of users or complex resumes, leading to performance issues.	Conduct performance testing early and optimize code for scalability. Use scalable cloud infrastructure and load-balancing techniques to prepare for user growth.

11. Budget and Resources

Budget Estimate:

Table 11.1 *Table Budget Estimate*

No.	Criteria	Price (USD)	Amount	Total (USD)
1	Working hour	2	2300	4600
2	Management cost	20%		920
Total				5232

Resources Needed:

- Human Resources:
    - Scrum Master: Responsible for managing the Agile process, facilitating sprints, and addressing any roadblocks.
    - Product Owner: Manages the product backlog, prioritizes features, and ensures that the project aligns with user needs and business goals.
    - Developer 1: Focuses on front-end development using React.js, including the design and implementation of the user interface.
    - Developer 2: Manages backend development using Node.js and implementation of AI/ML models.
- Hardware:
    - Development Laptops: High-performance laptops are needed for development and testing.
    - Cloud Server: AWS EC2 instance for hosting the application and database.
- Software:
    - Development Tools: Integrated Development Environments (IDEs) like Visual Studio Code or IntelliJ, and design tools like Adobe XD or Figma.
    - Security Tools: Subscriptions to security software and services for vulnerability scanning and data protection.
    - Project Management Tools: Tools like Trello for tracking tasks, managing sprints, and facilitating team collaboration.

12. Project constraints

Table 12.1 *Table about project constraints*

Constraint	Constraints Description	Guidelines for Acceptance
Economic	The total cost of the project cannot exceed $6000. This includes design, development, production, maintenance, and operational costs.	Elements for consideration are design costs, production costs, maintenance costs, operating costs, and sales price.
Environmental	The final product should operate optimally in a standard office environment with proper lighting and a stable internet connection. The design should also consider environmental factors like temperature range, humidity, and electromagnetic interference. Additionally, it should be designed for recycling and the use of recycled materials.	The impact of the design on the environment, as well as the impact of the environment (e.g., temperature range, humidity, vibration, electromagnetic interference immunity, and shock) on the design, should be considered. Design for recycling and design to use recycled materials should also be considered.
Ethical	Ethical considerations include protecting user data and ensuring privacy. The platform should adhere to data protection regulations and industry best practices to safeguard user information.	Ethical considerations can be broad. Areas that are typically addressed include intellectual property, reverse engineering, privacy, security, and the conflict between cost and safety.

Public health, safety, and welfare	The product should ensure user safety and minimize risks related to data security and privacy. It should not present any electrical or physical hazards.	Includes safety standards as well as the impact of the design on users (for example, electrical or physical hazards).
Social and Global	The product will reduce the time and effort required for tasks related to resume building and job search. It should address aspects like benefits, risks, and user acceptance, and consider global and socially responsible engineering practices.	Addresses aspects such as benefits, risks, the human-machine interface, the acceptance of products by the intended user or by society at large, and global and socially responsible engineering.
Cultural	N/A	Which cultural characteristics could influence the approach? How do the designs of diverse cultures differ?
Sustainability	The product must be designed for future maintenance and upgrades, including providing software updates, bug fixes, and feature improvements. It should ensure the sustainability of resources and design for long-term reliability and durability.	Refers to the sustainability of resources, including material, energy, supplies, manufacturing techniques, personnel, operation, and the need for additional infrastructure, as well as the sustainability of the design including reliability, lifetime, durability, reusability, and maintainability.

13. Conclusion

This project aims to revolutionize the resume-building and job search process by using AI to provide personalized resume recommendations and optimization tools. It simplifies these tasks for users, enhancing their job search effectiveness and reducing effort. The platform will advance AI applications in career services, demonstrating its potential to transform professional development and contribute significantly to the field of Software Engineering.

14. References

Table 14.1 *Table about references*

No.	References	Document Information
1	Scrum Model	https://en.wikipedia.org/wiki/Scrum_(software_development)
		https://www.atlassian.com/agile/scrum
		https://www.digite.com/agile/scrum-methodology/
		https://www.scrum.org/resources/scrum-guide
2	Technical	https://ai.google.dev/gemini-api/docs?hl=vi
		https://react.dev/learn
		https://nodejs.org/fr
		https://www.python.org/
3	Standard	https://www.nws.noaa.gov/oh/hrl/developers_docs/General_Software_Standards.pdf
		https://standards.ieee.org/standard/12208-2017.html
		https://en.wikipedia.org/wiki/Scrum_(software_development)

15. **Attached "DESCRIPTION OF PRODUCT REQUIREMENTS"**

C1SE.02-DESCRIPTION OF PRODUCT REQUIREMENTS.docx

16. **Attachment**

https://drive.google.com/drive/folders/1RZtmGyhkQ0eHeKxCpVgUtui4NJLl_eii?usp=sharing